WHAT IS CLAIMED IS:

1.   A method of forming a negative pattern of carbon nanotubes which comprises the steps of:

(a)   providing surface-modified carbon nanotubes by introducing double bond-containing functional groups into the surface of the carbon nanotubes;

(b)   dispersing the surface-modified carbon nanotubes in an organic solvent along with a photoinitiator to obtain a liquid coating composition;

(c)   applying the liquid coating composition to a substrate and evaporating the organic solvent by prebaking to provide a coating film on the substrate;

(d)   exposing the coating film to UV light through a photomask having a desired pattern to induce photo-polymerization of the carbon nanotubes in the exposed areas of the coating film; and

(e)   developing the coating film with an organic developer to remove unexposed areas of the coating film and to obtain a negative pattern of the carbon nanotubes.
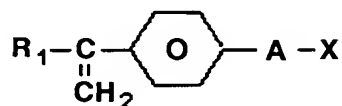
2.   The method according to claim 1, wherein the double bond-containing functional group is introduced from a compound having a structure of Formula 1 or Formula 2:

Formula 1

$$H_2C = \overset{\overset{\displaystyle R_1}{|}}{\underset{\underset{\displaystyle X}{|}}{C}} \\ C = O$$
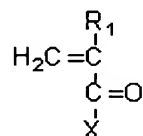
(wherein, R_1 is H or CH_3; and X is Cl, NH_2 or OH); and

Formula 2

$$R_1 - \overset{\overset{\displaystyle }{\|}}{\underset{\displaystyle CH_2}{C}} - \langle O \rangle - A - X$$

(wherein, R_1 is H or CH_3; A is $C_1 \sim C_6$ alkylene or $R_2 - \overset{\overset{\displaystyle O}{\|}}{C}$ (in which R_2 is direct bond or $C_1 \sim C_6$ alkylene) ; and X is Cl, NH_2 or OH).

3.   The method according to claim 1, wherein the carbon nanotubes are produced by an arc discharge method, a laser ablation method, a high temperature filament plasma chemical vapor deposition method, a microwave plasma chemical vapor deposition method, a thermochemical vapor deposition method or a thermal decomposition
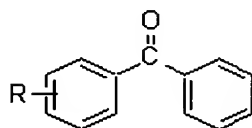
method.

4.   The method according to claim 1, wherein the photoinitiator is selected from the group consisting of an acetophenone-based photoinitiator, a benzoin-based photoinitiator, a benzophenone-based photoinitiator, a thioxantone-based photoinitiator, a special grade photoinitiator and a co-polymerizable photoinitiator.

5.   The method according to claim 4, wherein the special grade photoinitiator is selected from the group consisting of 1-phenyl-1,2-propanedione-2-(O-ethoxycarbonyl)oxime, 2,4,6-trimethyl benzoyl diphenyl phosphine oxide, methyl phenylglyoxylate, benzil, 9,10-phenanthraquinone, camphorquinone, dibenzosuberone, 2-ethylanthraquinone, 4,4'-diethylisophthalophenone and 3,3',4,4'-tetra(t-butylperoxycarbonyl)benzophenone.
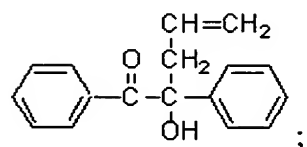
6.   The method according to claim 4, wherein the co-polymerizable

photoinitiator is selected from the group consisting of compounds of

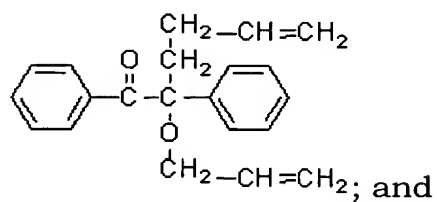Formulas 3 to 6:

Formula 3

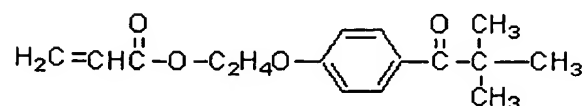(wherein, R = (meth)acryl group);

Formula 4

Formula 5

Formula 6

7.   The method according to claim 1, wherein the substrate is selected from the group consisting of a glass substrate, a silicone substrate and a plastic substrate.

8.   The method according to claim 1, wherein the liquid coating composition further comprises a co-photoinitiator.

9.   The method according to claim 8, wherein the co-photoinitiator is selected from the group consisting of triethanolamine, methyldiethanolamine, triisopropanolamine, 4,4'-dimethylamino benzophenone, 4,4'-diethylamino benzophenone, 2-dimethylamino ethylbenzoate, 4-dimethylamino ethylbenzoate, 2-n-buthoxyethyl-4-dimethylaminobenzoate, 4-dimethylamino isoamylbenzoate, 4-dimethylamino-2-ethylhexyl benzoate and Eosin Y.

10.   The method according to claim 1, wherein the liquid coating composition further comprises co-polymerizable monomers or oligomers containing double bonds for the carbon nanotubes to copolymerize with the

monomers or oligomers during the photo-polymerization step (d).

11.   The method according to claim 1, wherein the liquid coating

composition further comprises polymers or oligomers free of double bonds,

as a coating binder.